is, in terms of better, equal, or worse—was much higher than agreement between actual rating scores. This suggests that, for the purposes of a clinical trial, it may be more reliable for a clinician to assess a patient's state in relative terms (as being better or worse than before) than to rate his condition in absolute terms on different occasions.

Summary

A self-controlled comparative trial of phenelzine (30 mg. b.d.), dexamphetamine sulphate (5 mg. b.d.), and lactose in the treatment of depressive illness is reported. The drugs were given consecutively, each for a fortnight, in randomized order. The results are based on the study of 43 patients.

In their effect on the clinical manifestation of depression neither phenelzine nor dexamphetamine was significantly better than lactose. On the clinical manifestation of agitation and anxiety, however, phenelzine was significantly better than both dexamphetamine and lactose; dexamphetamine was again no better than lactose.

Independent ratings were made by two observers of the changes in intensity of the clinical manifestations. For depression and agitation there was fairly good agreement between the observers; for anxiety the agreement was poor.

The findings suggest that the beneficial effect of phenelzine in depressive illness is due more to a sedative action in relieving anxiety than to a specific anti-depressive action.

We thank Professor P. Armitage, of the Medical Research Council's Statistical Research Unit, and Dr. R. Cawley, of the Institute of Psychiatry, for advice on the statistics; Mrs. Vejs, pharmacist at the Bethlem Royal Hospital, for the dispensing; and William Warner and Company for the supply of "nardil" tablets and identical-looking tablets of dexamphetamine sulphate and of lactose.

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Leprosy, a disease which has existed in Fiji for many years, may well be on the way out. The Governor of the territory, Sir Kenneth Maddocks, said recently when he attended the golden jubilee of Makogai Leprosy centre: "We can at last begin to look forward to the day when the centre will no longer be needed. This is a real occasion for rejoicing and thankfulness after 50 years of devoted work." In 1948 the number of patients in the centre was 664. To-day the number there is fewer than 280, and in 1958 and 1959 alone 121 and 131 cases respectively were discharged as cured. The Governor paid a tribute to those who had helped with the centre's work, and, in particular, to the Missionary Sisters of the Society of Mary and the Fijian Sisters of the Little Sisters of Nazareth. He also praised the generosity of the people of New Zealand who had subscribed hundreds of thousands of pounds to a fund for the relief of leprosy.

E.C.H.O. TYPE 9 INFECTION IN 1960

A STUDY IN GENERAL PRACTICE

BY

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The E.C.H.O. viruses as well as other enteroviruses, such as the Coxsackie A and B groups, are now recognized as causative agents in many cases of "non-paralytic poliomyelitis," and this form of enterovirus infection has already been experienced in several areas in Scotland (*Brit. med. J.*, 1961). Although a variety of E.C.H.O. and Coxsackie virus types have been identified in the Western Region in recent years, 1960 was the first year in which there occurred a large-scale epidemic due to a single enterovirus type—in this instance E.C.H.O. 9. Many cases of aseptic meningitis were admitted to the infectious-disease units in the region during the summer and cases of febrile illness with rash, mainly in children, were common. The present paper describes a number of cases of the latter type.

In June two practitioners drew attention to an epidemic of a rubella-like syndrome in children from unrelated families in the northern area of Glasgow. The possibility was recognized that this might be a manifestation of E.C.H.O. 9 infection, and it was arranged that the practitioners would notify such cases to us and thus enable an epidemiological study to be made. Many of these patients were visited by one of us (J. B. L.) and a preliminary account of some of the features noted in them has been recorded (Landsman, MacAnespie, Weetch, and Bell, 1960). More detailed information is provided here.

Material and Methods

Twenty-three families were studied between June and October, 1960. All but one of the cases were seen in their own homes, usually within 24 hours of their notification to us. Most families were visited more than once; at these visits details of history and clinical appearances were recorded and inquiry was made about illness of any kind in the family before the date of sickening of the notified case and during the period of surveillance. Whenever possible, specimens for virological examination were taken from patients and contacts. Throat swabs, rectal swabs, specimens of faeces, or swabs of freshly passed faeces were submitted for virus isolation and serum samples for the presence of antibodies. Only faecal specimens were obtained from the first cases seen, but in later cases throat swabs were mainly used. Many of the patients were children, so that paired samples of serum were not always obtained.

A member of a family who reported some departure from normal health immediately before our first visit or during the 10–14 days when the household remained under our observation was regarded as having had an "incident." As would be expected, some examples occurred where the incident could quite clearly be ascribed to some other cause. There were six such incidents, and these are shown in Table I.

TABLE I.—*Diagnosis and Results of Laboratory Examinations in Six Incidents Ascribed to Some Other Cause*

Incident No.	Sex	Age in Years	Diagnosis	Laboratory Results
1	F	1½	Measles (typical catarrhal signs and rash. History of contact)	No virus isolated from throat and rectal swabs
2	F	2½	Measles (as above)	As above
3	F	25	Upper respiratory infection	No specimens obtained
4	F	2½	Sensitization rash and scabies (had been given penicillin for respiratory infection)	Coxsackie group A virus isolated from faeces
5	M	28	Acute exudative tonsillitis: ? infectious mononucleosis	Blood film suggestive of infectious mononucleosis: 47% mononuclear cells. Two Paul-Bunnell tests negative. No virus isolated from throat swab
6	M	5	Mumps (contact of sibling with mumps confirmed serologically)	E.C.H.O. type 9 virus isolated from throat swab

Incidents 1, 2, and 3 occurred in one family.

The child (incident No. 6) in whom mumps was recorded was the younger sibling of a boy with parotid and submandibular gland enlargement and developed mumps 14 days after his exposure. The older child presented the typical rash and other symptoms of an E.C.H.O. 9 infection on the third day of his mumps. The diagnosis of mumps was confirmed by a fourfold rise in antibody titre. This family has been retained because of the undoubted evidence of E.C.H.O. 9 infection in the older sibling.

The study therefore concerns 20 families. Of the 80 persons comprising these families, 43 sickened and 37 remained well.

Virus Isolations.—Swabs were taken using cotton-wool on the end of a wooden applicator. This end was immediately broken into a bijou bottle containing 2 ml. of phosphate buffered saline with added antibiotics. The specimens were delivered within three hours to the laboratory, where the swabs were removed, the fluid suspension was centrifuged at 3,000 r.p.m. for 30 minutes, and the clear supernate was used as the inoculum. Stools were homogenized in phosphate buffered saline with added antibiotics to give a 20% suspension and centrifuged at 3,000 r.p.m. for 30 minutes. The supernate constituted the inoculum. Virus isolations were attempted by inoculating the prepared extracts into primary tissue cultures of both human amnion and rhesus monkey kidney (Bell, Stott, and Ross, in preparation). The tubes were examined microscopically for cytopathic changes daily for 14 days, and where appropriate the virus was identified by neutralization tests.

Serological Examinations.—Serum samples were stored at -20° C. All sera were examined by complement fixation (C.F.) for antibodies against an E.C.H.O. type 9 virus isolated locally from one patient (Bell *et al.*). In selected cases neutralization tests were also performed. Current infection was considered to have occurred only if a fourfold or greater increase in C.F. or neutralizing antibody was demonstrable during the course of illness. Where only a convalescent specimen of serum was available a C.F. antibody titre of 128 or greater or a neutralizing antibody titre of 64 or greater was regarded as suggestive of recent infection.

Results

Table II gives the age-and-sex distribution of the 80 persons in the 20 families in the two categories "sick"

(those reporting an "incident") and "well." More than half of the individuals at risk suffered an incident (43 of the 80); half of the incidents were in the age-

TABLE II.—*Age-and-Sex Distribution of "Sick" and "Well" in 20 Families*

Age in Years	Male		Female		Total	
	Sick*	Well	Sick*	Well	Sick	Well
<1	3	—	1	—	4	—
1-4	15	4	2	—	17	4
5-14	5	1	5	5	10	6
15+	5	14	7	13	12	27
Total	28	19	15	18	43	37

* The age range of those who were sick was 3 months to 32 years.

group under 5 years. There was an excess of males in the group studied, and 60% of males but only 45% of females reported an incident.

Two or more incidents were reported in 14 families. In eight families the first person to become sick was a child of pre-school age. Two of the 12 adults but none of the four infants who were sick were index cases. The majority of families (11 of the 20) consisted of the parents and two children; multiple infections were encountered in nine of these. Five families consisted of three persons and one family each consisted of two, five, six, and eight persons. Multiple infections were reported in the three largest families and in two of the five families of three.

Laboratory Examinations

"Sick" Persons.—Throat swabs, specimens of faeces, or rectal swabs were obtained from 37 sick persons (Table III). Both types of swab were obtained from 8, throat swabs only from 18, and faecal specimens only from 11. E.C.H.O. 9 virus was isolated from 15 (79%) of the 19 faecal specimens and from 13 (50%) of the 26 throat swabs. Virus was isolated from the throat

TABLE III.—*Isolation of Virus from Faecal Specimens and Throat Swabs from 37 "Sick" Persons*

Type of Swab	Isolation of E.C.H.O. 9 Virus		
	Positive	Negative	Total
Faecal	15 (79%)	4	19
Throat	13 (50%)	13	26
Total	28 (62%)	17	45

five to seven days before the onset of illness in three patients, and was also found in one case on the tenth day of illness. No faecal specimens were examined before the onset of illness in persons who subsequently became sick, but of eight specimens examined between the sixth and tenth days of illness six contained virus. Details of these examinations are given in Table IV. Serological examinations were carried out in 15 sick persons, from 12 of whom one or other type of swab was also obtained. The titres of C.F. antibody to

TABLE IV.—*Virus Isolation Related to Duration of Illness*

Days between Onset and Examination	Faecal Specimens			Throat Swabs		
	Virus Pos.	Virus Neg.	Total	Virus Pos.	Virus Neg.	Total
-7 to -2	—	—	—	3	1	4
0 .. +5	9	1	10	9	9	18
+6 .. +10	6	2	8	1	2	3
+10 .. +14	—	1	1	0	1	1
Total ..	15	4	19	13	13	26

E.C.H.O. 9 virus were diagnostic of infection in 12 of the 15 sick, and virus was isolated from seven of these (Table V).

TABLE V.—Results of Complement-fixation Tests for E.C.H.O. 9 Antibody in 15 "Sick" Persons

No. of Specimens	No. of Persons for Whom the Test was		Total
	Diagnostic of Infection	Not Diagnostic	
Single	4 (2)	3	7
Paired	8 (5)	—	8
Total	12 (7)	3	15

Figures in parentheses indicate number of patients from whom virus was isolated.

"Well" Persons.—Fourteen throat swabs and two rectal swabs from 15 well persons were also examined for the presence of virus. Virus was isolated from five throat swabs and one rectal swab. Six of the throat swabs which gave negative results were from adults. Single specimens of serum, none of which showed significant levels of antibody to E.C.H.O. 9 virus, were obtained from four adults who remained well. Paired specimens from a fifth adult showed titres of 128 in the first specimen and 8 in the second, which suggested recent infection.

Families.—Evidence of E.C.H.O. 9 virus infection was found in all but one of the 20 families visited. Virus was isolated from one or more members of 18 families, in eight of which serological examination provided additional evidence of infection. In one family the diagnosis of E.C.H.O. 9 infection was based solely on a fourfold rise in C.F. antibody titre during the course of illness. The only family in which evidence of infection was lacking reported two "incidents," in girls aged 7 and 10 who were among the first to be seen with the "typical" illness. By the time of our visit to the house both were convalescent. A specimen of faeces was obtained from the younger child but no virus was isolated. Single specimens of serum from the older child and from the parents were examined with negative results.

Presenting Features of Illness

These features are shown for adults (15 years and over) and children separately in Table VI. Headache and vomiting were common, and were found at all ages. Rash was present in 23 out of 31 children but in only 1 out of 12 adults affected. Adenitis was more often

TABLE VI.—Presenting Features Compared in Adults and Children

Presenting Feature	No. of Children	No. of Adults	Total
Rash	23	1	24
Headache	16	7	23
Lymphadenitis	20	2	22
Vomiting (or nausea)	15	6	21
Anorexia	11	3	14
Feverishness	11	2	13
Listlessness	8	2	10
Sore throat	4	4	8
Irritability	7	—	7
Drowsiness	6	—	6
Total persons	31	12	43

Abdominal pain, sweating, shivering, loose stools, photophobia, and convulsions were each reported once or twice.

found in children. The cervical glands were enlarged in 21 cases; in 7 of these the axillary or inguinal glands were also involved. In one case, only the axillary glands were enlarged. In most instances the glands were small; large soft glands, however, were noted in a few patients.

The pattern of illness at onset with headache, shivering, and severe aches and pains had suggested a diagnosis of "influenza" to several of the adult patients. Four of the 31 children were so little upset by their infection that but for the appearance of rash their illness would have gone unremarked. Most of the patients, in fact, were not acutely ill, and recovered within four or five days. One boy aged 8 years was admitted to hospital with meningitis. He gave a history of vomiting and rash some two weeks before he was first seen by us on July 1, 1960. He recovered from these after two or three days, but on June 29 he complained of sore throat, and was thought to be developing mumps, which was epidemic at the time. No evidence of mumps was found on July 1, but there was some faucial redness and the cervical lymph nodes were enlarged. The child was bright and lively. His two younger siblings had developed rash on June 28 and 30. On July 4 he complained of headache and neck pain and fainted on getting out of bed. In the presence of fever and nuchal rigidity he was thought to have meningitis and this was confirmed in hospital, where a cell count of 1,000/c.mm. in the cerebrospinal fluid was reported. E.C.H.O. type 9 virus was isolated from this boy's stool on July 2; serum specimens showed a rise in C.F. antibody titre to E.C.H.O. 9 virus from 8 to 128 during the course of illness. His two brothers also excreted virus in their stools.

Rash.—This was the feature which first drew attention to the epidemic, being recognized as different from those of rubella and measles, although there were some similarities. The rash was seen in two forms, which were often present together: (1) minute discrete papules, pink or colourless, most often appearing on the trunk and limbs, and (2) larger maculo-papular elements, pink or red, which were sometimes confined to the face. In the only adult in whom rash was seen it was confined to areas of sunburn, and after exposure to sun became much brighter in colour. As shown in Table VII, the age-group under 5 years had the highest proportion of rashes, although it accounted for only 49% of "incidents."

TABLE VII.—Frequency of Rash at Different Ages

Age-group (Years)	No. of Total "Sick" in Age-group	No. of Age-group with Rash
< 5	21 (49%)	17 (81%)
5-14	10 (23%)	6 (60%)
15+	12 (28%)	1 (8%)
Total	43 (100%)	24 (56%)

Thirteen of the 24 patients with rash developed it on the day of onset of illness, and in a further 7 the rash appeared within the first 24 hours.

Incubation Period.—Many of the children in these families were known to be contacts of more than one infected playmate, and their incubation periods could not be assessed with accuracy. The intervals between index and later cases in families with multiple infections ranged from 1 to 11 days, with a mean interval of 4.7 days, and a mode of 5 days. This is in keeping with previously reported outbreaks.

Illustrative Family History

The following summary of a family of four in which each member reported sick illustrates some of the features of E.C.H.O. 9 infection.

This family was first visited on July 14, 1960, because of illness in the younger of the two children, with onset on July 11. Both parents became ill on July 19, and the other

child in the house—aged 3½—on July 20. The onset of illness in the younger child was characterized by “very sore crying” and by a tendency to hold his right ear. This was examined by his doctor, but the drumhead was found to be normal. The following day he vomited twice and later developed a rash. This was seen on his face and was described by his mother as “raised, red, and blotchy.” The child made a rapid recovery, and when seen on July 14 presented a faded pink macular rash on the face with discrete pink papules about the size of a pinhead on the trunk. The cervical and axillary glands were enlarged.

The father, a bus driver aged 29, complained of generalized aches and pains, “much worse than the Asian ‘flu,’” at onset on July 19. On the 21st his doctor reported to us that he had attended the surgery that morning because of right chest pain, sore throat, sweating, and shivering. He was found to have crepitations at the left base. X-ray examination of the chest on the same day was normal. The mother, aged 25, had a headache, lower abdominal pain and backache, nausea and vomiting on July 19. When seen on the 21st she appeared pallid and tired and still had abdominal pain. The older child, who became ill on July 20, complained of headache, vomited, and was feverish. No rash appeared and there were no meningeal signs.

All the members of the family recovered without further incident. E.C.H.O. virus type 9 was isolated from throat swabs taken from the mother and both children on July 14, and from a swab of freshly passed faeces from the younger child on the same day. Single specimens of serum from the parents on the 21st gave—for the mother—a titre of 512 and for the father a titre of 8.

Discussion

The epidemic of E.C.H.O. type 9 infection in Glasgow in 1960 was not an isolated phenomenon, for correspondence (Parton, 1960; Smith, Bell, Smith, and Bell, 1960) following a preliminary report (Landsman *et al.*, 1960) indicated that similar cases occurred in areas from the South of Scotland to the Midlands of England between July and September. Edinburgh also experienced E.C.H.O. 9 infection during 1960 (Constable and Howitt, 1961), but the illness differed from that in other areas in that the presenting features were headache and abdominal pain; rash was reported in only 1 out of 17 children affected.

Variation in the clinical manifestations of E.C.H.O. 9 infection has been made apparent by reports from several areas in recent years. Some of these reports were commented on (*Brit. med. J.*, 1960), and the need was stressed for “combined investigative attack by general practitioners, epidemiologists, and virologists” in order to distinguish between the clinical features of infection by different enteroviruses. The present paper is the result of just such a combined attack. Some of the points of similarity between this and other outbreaks may be reviewed.

The rate of isolation of E.C.H.O. 9 virus was high—in faecal specimens 79% (15 of 19), and in throat swabs 50% (13 of 26). Of the total of 43 sick persons, 24 carried the virus and five others had serological evidence of infection. The number of proved infections was thus 29—a rate of 67.4%, only slightly lower than the rates of 70 and 84% respectively recorded by Galpine, Clayton, Ardley, and Baster (1958) in Coventry, and by Sabin, Krumbiegel, and Wigand (1958) in Milwaukee. The latter workers also reported the isolation of virus during the week prior to onset of illness.

Recovery of virus from faecal specimens or throat swabs was recorded up to the tenth day of illness in

some of the Glasgow cases—a period similar to that found in the series reported by Tyrrell, Lane, and Snell (1958), who failed to isolate virus from throat swabs after the sixth day, and from faeces after the tenth day. Constable and Howitt (1961), however, demonstrated virus in stools of two patients eight and nine weeks after the onset of illness, although most of their patients ceased to excrete virus after two weeks.

Serological examination demonstrated the presence of complement-fixing and neutralizing antibody in high titre even in the first week of illness (Bell *et al.*).

The methods of diagnosis used were successful in 19 of the 20 families visited. Although the causative agent was not proved in all patients (particularly in some of the adults whose illness was so mild as not to require medical attention) the similarity between the clinical picture in five whose infection was proved and six from whom no specimens were obtained makes it reasonable to consider that all were the result of E.C.H.O. 9 infection. The virus was, moreover, often known to be present in the other members of the family. Further to this, it may be mentioned that Smith *et al.* (1960) reported the isolation of virus from two of four adults, without rash but with symptoms similar to those in this series, who were examined during an epidemic in the Newcastle upon Tyne area in the autumn of 1960. The epidemic involved a number of children whose illness and rash were essentially the same as described in our preliminary account.

It would seem, indeed, that adults and children react differently to E.C.H.O. 9 infection not only in the type of illness suffered but also in attack rate. In this respect it is interesting that the proportion of adults in this outbreak who became sick was 31%, where Galpine *et al.* (1958) and Tyrrell *et al.* (1958) recorded rates of 17 and 10% respectively.

The illness in adults differed from that in children principally in regard to the occurrence of a rash, for only 1 out of 12 adults as against 23 out of 31 children were thus affected. Although headache and nausea or vomiting were common complaints at all ages, the presenting symptoms in adults were more suggestive of acute gastro-intestinal upset or of “influenza” than of the onset of any of the common exanthemata. Others have reported severe muscular pains in adults (Lyle, 1959), and Sabin *et al.* (1958) recorded neck and back pain more frequently among adults.

The proportion of cases with rash in outbreaks of E.C.H.O. 9 infection varies considerably—from 10 to 60% of reported cases. In this series the figure was 56%, an interesting contrast to the concurrent epidemic (Constable and Howitt, 1961) in Edinburgh, some 50 miles (80 km.) distant, in which only 1 out of 17 cases (6%) had rash. Diversity of lesions in the rash is recognized; macular and maculo-papular eruptions are common, but in some patients the rash is petechial in character. Both discrete and confluent maculo-papular rashes—pink or red, but, in the form of minute papules, as it frequently was, often colourless—appeared in this series. Although the petechial rash was not seen in these practice cases, it was identified in patients admitted to hospital at the same time.

The series was similar to that of Sabin *et al.* (1958) in the finding that rash was commonest in the youngest children (some 70% of cases) and least common in older children and adults (6 to 8%). These authors found that the age-group 3 to 6 years was important in

introducing infection into the family; in this series the majority of index cases were in the age-group under 5 years.

Outbreaks of enteroviral infection such as this are likely to be identified with increasing frequency as a result of the development of new techniques in the virus laboratories and the appreciation that infection with these viruses may give rise to diverse clinical syndromes. The 1960 epidemic in Glasgow not only provided an opportunity to become familiar with the variable features of E.C.H.O. type 9 virus infection but also offered an occasion for fruitful co-operation between the general practitioner and the hospital with its special diagnostic facilities.

Summary

During an epidemic of E.C.H.O. 9 virus infection details of illness were recorded in 20 families comprising 80 persons. Of 43 who reported "sick," 31 were children. The majority of illnesses were mild, but one boy developed meningitis.

Specimens of faeces or throat swabs for virus isolation were obtained from patients and contacts, and sera were examined by complement-fixation (C.F.) for antibodies to E.C.H.O. 9 virus. Infection was confirmed in 19 of the 20 families. Virus was isolated from 15 of 19 faecal specimens (79%) and from 13 of 26 throat swabs (50%) from sick persons. Titres of C.F. antibody were diagnostic of infection in 12 of 15 sick examined. Virus was isolated from 5 of 14 throat swabs and one of two rectal swabs from 15 "well" persons.

The pattern of illness differed in adults and children, but headache and vomiting were common features at onset at all ages. Illness in adults sometimes suggested "influenza," but in children fever and rash were most prominent. Twenty-three out of 31 children and 1 out of 12 adults had rash, which appeared in two forms—minute discrete papules, pink or colourless, and larger maculo-papular elements, pink or red.

Some of the features of the study are compared with those of other outbreaks of E.C.H.O. 9 infection.

We thank Drs. W. J. Weetch and H. MacAnespie for allowing us to study their patients, and Dr. Constance A. C. Ross for carrying out the complement-fixation tests.

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The London Group of doctors of the Family Planning Association held a week-end conference in London from November 3 to 5 which was attended by 86 doctors working in F.P.A. clinics in all parts of Great Britain. The theme of the conference was "The Marriage Relationship," and it covered aspects of this relationship in different cultures, adolescent and teenage attitudes towards it, marital difficulties in the new towns, and the part that the F.P.A. clinic can play in the treatment of marital problems.

ISOLATION OF COXSACKIE VIRUSES FROM NORMAL CHILDREN AGED 0-5 YEARS

BY

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Since the widespread use of poliomyelitis vaccines, more attention has been given to other viruses which cause meningitis and poliomyelitis-like illnesses. Coxsackie viruses have been isolated from patients with a variety of illnesses and occasionally from apparently normal people, so that the aetiological significance of their presence is often difficult to assess. A knowledge of the incidence of these viruses in the normal population should prove useful in the interpretation of the significance of Coxsackie virus isolations from patients.

There have been numerous reports in the literature of the presence of Coxsackie group B viruses in this country but few of the group A viruses apart from type 9, which grows readily in tissue culture and has been isolated frequently. Forrester and Tobin (1951) isolated a type A1 virus from the faeces of a child suffering from muscular weakness whose cerebrospinal fluid had increased protein and a normal cell count. Type A2 virus has been reported on three occasions (Findlay and Howard, 1950; Tobin, 1953). Howard isolated an A4 strain from a case of poliomyelitis-like illness and Stuart-Harris isolated a type A10 virus from a case of herpangina (Tobin, 1953). Grist (1960) isolated type A7 viruses from 33 patients in an outbreak of poliomyelitis-like illness in Scotland in 1957. Alsop, Flewett, and Foster (1960) grew a number of type A16 viruses from patients with pyrexia and vesicular lesions in the mouth and on the hands and feet.

These scanty reports of group A viruses probably reflect a reluctance to use suckling mice for virus isolation rather than the rarity in this country of group A viruses. According to Gear (1959), infections with this group are among the most prevalent of all virological infections.

In 1957-9 the Public Health Laboratory Service undertook a survey of the incidence of poliomyelitis virus in normal children aged 0 to 5 years in England and Wales, and the opportunity was taken to use some of the specimens of faeces collected to determine the incidence of Coxsackie virus infection.

Materials and Methods

The children included in the poliomyelitis survey were taken at random from the birth registers. Specimens of faeces were collected over a one-year period beginning in June, 1958, from urban areas (Table I) within greater London north of the Thames. The random sampling method used for the selection of children and the method of preparing faecal extracts have been described by Spicer (1961). Faecal extracts from some of these specimens were prepared by Dr. C. E. D. Taylor, of the Central Public Health Laboratory, Colindale, who kindly made them available to me after their examination in tissue culture.

Mouse Inoculation.—Before inoculation, faecal extracts were stored at -10° C. or less until

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